

CLAIMS

I claim:

- 1 1. A fuel pressure accumulator for an internal combustion engine comprising:
2 a segmented housing including a front wall defining a front wall internal cavity, a
3 rear wall defining a rear wall internal cavity, said front wall internal cavity and said rear
4 wall internal cavity facing each other, and a fuel delivery ring positioned between said
5 front and rear walls and forming with the front wall internal cavity and said rear wall
6 internal cavity a chamber,
7 a flexible diaphragm positioned between said rear wall internal cavity and said
8 fuel delivery ring and defining a gas chamber adjacent said rear wall and a fuel
9 accumulation chamber adjacent said front wall internal cavity and said fuel delivery ring,
10 a filter positioned between said front wall and said fuel delivery ring, and
11 a fuel communication port positioned in said front wall and a fuel communication
12 port positioned in said fuel delivery ring,
13 so that fuel enters one of the fuel communication ports, passes through the filter
14 and out of the other fuel communication port, and the flexible diaphragm flexes in
15 response to the change in pressure of the fuel in said fuel accumulation chamber.
- 1 2. The fuel pressure accumulator of claim 1, and further including a sight glass
2 assembly positioned in said front wall for viewing said filter.

1 3. The fuel pressure accumulator of claim 1, wherein said fuel delivery ring and front
2 wall are configured so that said fuel delivery ring is repositionable with respect to said front
3 wall to reorient the fuel communication port of the front wall with respect to the fuel
4 communication port of the front wall.

1 4. A fuel pressure accumulator and filter for an internal combustion engine
2 comprising:

3 a segmented housing including a front wall defining an inner cavity, and a rear
4 wall defining an inner cavity, said front wall inner cavity facing said rear wall inner
5 cavity,

6 a fuel delivery ring positioned between said front and rear walls, said fuel delivery
7 ring having opposed ends mounted to said front wall and said rear wall, and forming with
8 the front wall inner cavity and the rear wall inner cavity a chamber,

9 a flexible diaphragm positioned between said rear wall and said fuel delivery ring
10 and extending across said chamber,

11 said rear wall and said flexible diaphragm defining a gas chamber adjacent said
12 rear wall,

13 said front wall, said fuel delivery ring and said flexible diaphragm defining a fuel
14 accumulation chamber adjacent said front wall and said fuel delivery ring,

15 a fuel communication port positioned in said front wall,

16 a fuel communication port positioned in said fuel delivery ring,

17 a filter positioned between said front wall and said fuel delivery ring dividing said
18 fuel accumulation chamber into a filtered fuel chamber at said fuel delivery ring and an
19 unfiltered fuel chamber at said front wall,
20 so that fuel entering one of the fuel communication ports moves through the filter
21 and out of the other fuel communication port, and changes in pressure of the fuel move
22 the diaphragm.

1 5. The fuel pressure accumulator and filter of claim 4, and further including:
2 connector means rotatably connecting said fuel delivery ring to said front wall,
3 so that said fuel delivery ring can be rotated with respect to said front wall for re-
4 orienting the fuel communication port of said front wall with the fuel communication port
5 of said fuel delivery ring.

1 6. The fuel pressure accumulator and filter of claim 5, and further including a sight
2 glass assembly positioned in said front wall for viewing said filter.

1 7. The fuel pressure accumulator and filter of claim 4, wherein said fuel
2 communication port in said delivery ring comprises a plurality of fuel communication
3 ports.

1 8. A fuel pressure accumulator and filter for an internal combustion engine
2 comprising:

3 a segmented housing including a front wall defining an internal cavity and a rear
4 wall defining an internal cavity, with said cavities facing each other and forming a
5 chamber,

6 a flexible diaphragm positioned between said front wall and said rear wall and
7 across the chamber and defining with said rear wall a pressure responsive gas chamber
8 and defining with said front wall a fuel accumulation chamber,

9 a fuel filter positioned between said front wall and said flexible diaphragm,

10 a fuel inlet port defined in said front wall and a fuel outlet port defined between
11 said flexible diaphragm and said filter,

12 so that fuel enters through the fuel inlet port on one side of the filter, passes
13 through the filter and then exits through the outlet port, and the flexible diaphragm moves
14 in response to the changes in pressure of the fuel in the chamber.

1 9. The fuel pressure accumulator and filter of claim 8, and further including a sight
2 glass extending through said front wall for viewing the filter from outside the front wall.

1 10. The fuel pressure accumulator and filter of claim 8, wherein said front and rear
2 walls are configured to be repositioned with respect to each other.

1 11. The fuel pressure accumulator and filter of claim 8, wherein a fuel delivery ring is
2 positioned between said front wall and said rear wall and wherein said fuel outlet port is
3 positioned in said fuel delivery ring.

1 12. The fuel pressure accumulator and filter of claim 11, and wherein said fuel
2 delivery ring is configured to be rotatable with respect to said front wall for changing the
3 relative positions of the inlet port and the outlet port.

1 13. A fuel pressure accumulator and filter for an internal combustion engine
2 comprising:

3 a segmented housing including first and second housing segments, said housing
4 segments defining a chamber,

5 a flexible diaphragm extending across said chamber and defining with said second
6 housing segment a gas chamber and defining with said first housing segment a fuel
7 accumulation chamber,

8 a fuel filter positioned in and extending across said fuel accumulation chamber
9 and defining on one side thereof an unfiltered fuel accumulation chamber and defining on
10 the other side thereof a filtered fuel accumulation chamber,

11 a fuel inlet port in communication with said unfiltered fuel accumulation
12 chamber,

13 at least one fuel outlet port in communication with said filtered fuel accumulation
14 chamber,

15 means for changing the position of said fuel outlet port with respect to said fuel
16 inlet port for directing the fuel in different directions from said segmented housing,
17 so that fuel enters through the fuel inlet port on one side of the filter, passes
18 through the filter and then exits from the other side of the filter through the outlet port,
19 and the flexible diaphragm moves in response to the changes in pressure of the fuel in the
20 fuel accumulation chamber.

1 14. The fuel pressure accumulator and filter of claim 14, wherein
2 said at least one fuel outlet port comprises a plurality of fuel outlet ports each
3 extending in different directions.

1 15. The fuel pressure accumulator and filter of claim 14, and further including
2 a sight glass positioned in said first housing segment aligned with said filter for
3 observing the condition of said filter.

1 16. The fuel pressure accumulator and filter of claim 14, and further including
2 a fuel delivery ring positioned between said first housing segment and said second
3 housing segment, said fuel outlet port being formed in said fuel delivery ring, said filter
4 positioned between said fuel delivery ring and said first housing segment, and said
5 flexible diaphragm positioned between said fuel delivery ring and said second housing
6 segment, and connector means configured for connecting said fuel delivery ring to said
7 first housing segment at different orientations for adjusting the position of the fuel
8 delivery port with respect to the fuel inlet port.

1 17. A method of controlling changes in pressure of fuel and filtering fuel moving
2 from a fuel tank of an automobile to the engine of the automobile, comprising:
3 moving fuel from the fuel tank through an inlet port into an accumulation
4 chamber,
5 moving the fuel through a filter in the accumulation chamber to filter the fuel and
6 into engagement with a flexible diaphragm facing the accumulator,
7 moving the filtered fuel radially out of said accumulation chamber through a fuel
8 outlet port to the engine, and
9 moving the diaphragm with the filtered fuel in response to the changes in pressure
10 of the fuel in the fuel accumulation chamber.

1 18. The method of claim 17, and further including adjusting the position of the outlet
2 port with respect to said inlet port for directing filtered fuel to the engine.